TLC MAY BE HAZARDOUS TO YOUR TREES[1]

by Richard W. Harris

Abstract. A vigorous tree that will be easy to maintain is most likely attained if the tree starts with a good root system, is planted with good root-soil contact, has turf kept away from its trunk, is protected but free to move, and has well spaced scaffolds that are smaller than the trunk.

Most practices we do or recommend for good tree performance are essential, but some we have forgotten or actually do too thoroughly. This paper will focus on some of these practices and how they affect the growth of young trees. If we can establish a young tree with a well-developed root system, a strong branch structure, and vitality, we will have an excellent tree that should require little maintenance as it matures.

Well-developed roots essential. A strong root system is essential to provide stability and nourishment. Even field-grown stock is usually transplanted two times in the nursery and container stock three or four times. At each transplanting, there is the danger that kinked and circling roots will not be cut-back, straightened, and positioned carefully so as to not start or compound a root situation that will doom the tree to poor growth or even failure.

When inspecting trees for delivery, roots should be closely evaluated, particularly container-grown trees. We have found more than fifty percent of the root systems of some species so kinked and circled that there is no way they would adequately support a tree structurally or nutritionally (Fig. 1). Most of the problems occur at the trunk-surface created during the first transplanting — not because the roots had become pot-bound (3). These can be easily inspected. In fact, many times untying the tree from its stake will pinpoint the problem: the top will bend sharply at the ground level. A second simple test is to lift the tree by the trunk; the rootball should rise with the top, otherwise you have defective roots or are paying for a bigger tree than you are getting.

Circling roots around the periphery of the final container are not a reason to reject a tree. They should be cut and straightened when planted in the landscape.

Between the nursery and the landscape planting, be sure the roots are kept cool and moist. We have found that root tips warmed to 104°F for four hours will be killed. The soil in the outer inch on the exposed side of a rootball will be at or above 110°F for more than five hours on a sunny day even in November (7).

On the other hand, many areas in the midwest and north must guard against container roots freezing.

Ensure root/soil contact. The surface of the planting hole should be roughened-up and friable, especially if the hole is augered. The rootball should be cut and the circling and matted roots shortened and straightened. The irregular surfaces of the hole and the rootball will ensure better root penetration and water movement into the surrounding soil.

Amending the backfill soil with organic matter has not proven to be of value from a physical standpoint (1). Plants will probably grow more vigorously if the amendment has nutrient and biological components, but those can usually be added more cheaply and easily than mixing a bulky amendment to the backfill soil.

In almost all soils, except sandy ones, trees should be planted higher than they grew in the nursery. Often the soil and trees settle and drowning or crown rot can be a problem. If there is concern about the roots or rootball drying because of the high exposure, the tree can be mulched or the immediate surrounding soil raised.

Keep turf and weeds away. Turf, weeds and ground covers can compete with young trees for

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water, nutrients, and soil oxygen. In addition, some plants, such as Alta fescue, *Festuca arundinacea*, are alleopathic to most trees; that is, they give off chemicals that are toxic to other plants. Keeping the soil within a foot of the trunk free of other plants will almost eliminate the effects of competition and alleopathy (Fig. 2) (2). The bare area will also minimize mower injury.

Competition and alleopathy usually are not a problem with mature trees since tree roots explore such an extensive soil volume.

Stake trees only as needed. Young trees usually need stakes to *protect* their trunks. Some may need to be *anchored* until the rootball becomes established. Others, unfortunately, may need *support* to hold the trees upright.

For the tree's sake, it should be supported as little as possible so that it will be able to develop a strong tapered trunk able to better withstand storms.

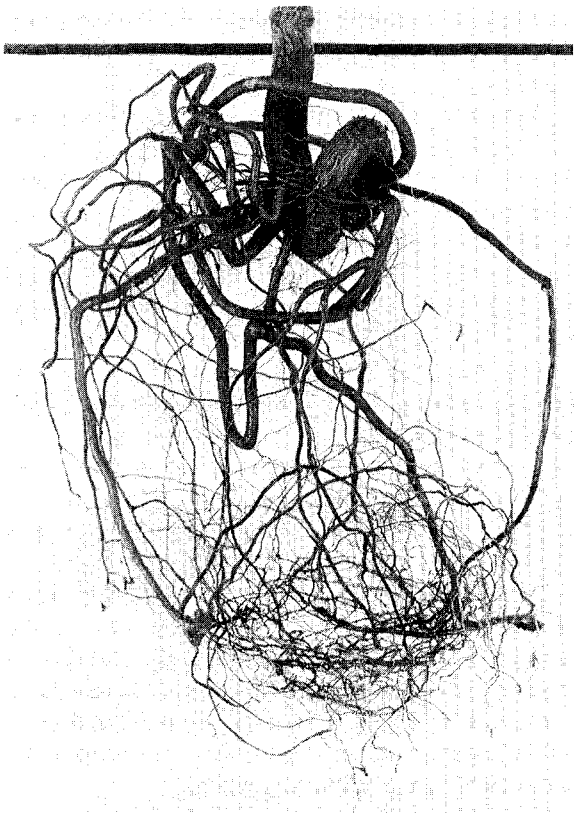

Fig. 1. Improper transplanting of an oak *(Quercus)* seedling has resulted in a kink of the main root and circling of secondary roots. Such a tree is doomed to failure.

Support staking commonly used is not only unsightly and often injurious but actually delays the development of a well-balanced, structurally strong top and root system (Fig. 3). In contrast to a tree that stands alone and is free to move, a staked tree will (4): Grow taller; Produce a decreased or even a reverse trunk taper; Grow less in trunk caliper near the ground but more near the top support tie; Develop a smaller root system; Offer more wind resistance than trees of equal height because the top is not free to bend; Be subject to more stress per cross-sectional area at the top support (5) (the ground for an unstaked tree); Develop uneven xylem around the trunk if it is closely tied to one stake (6). The trunk will grow or bend away from the stake.

All of these responses work against a tree being well formed and structurally strong. Except to protect a tree against vandalism, the less support a tree is given the sooner it will be able to fend for

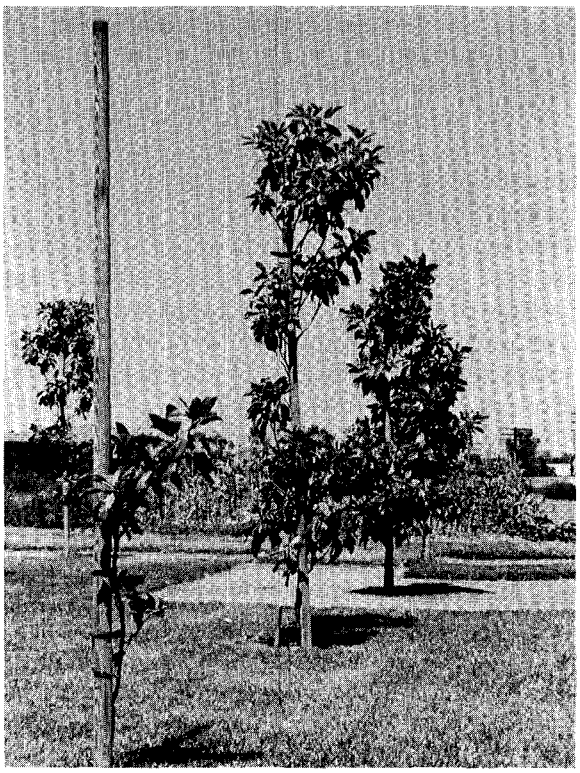

Fig. 2. Alta fescue, *Festuca arundinacea*, growing close to the trunk of a young southern magnolia, *Magnolia grandiflora*, has markedly reduced tree growth (tree in foreground) compared to growth of trees which had turf no closer than one foot from their trunks.

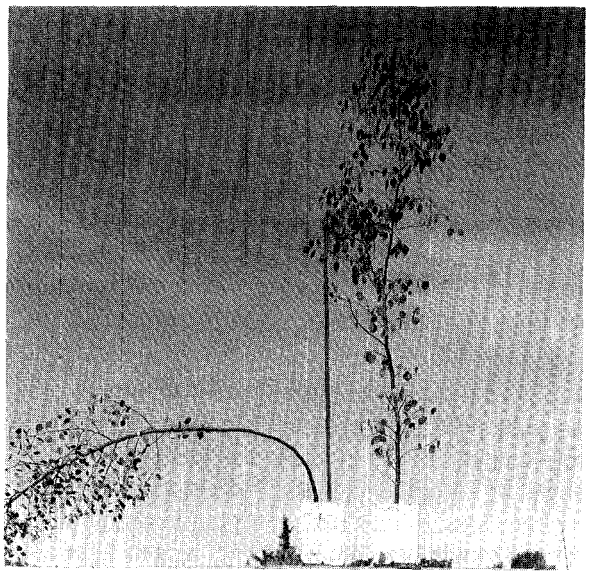

Fig. 3. The cumulative influence of pruning and staking on silver dollar gum, *Eucalyptus polyanthemos*, trees grown 11 months in 5-gal cans. One was tied to a stake with the lower laterals removed (left); the other was unstaked with lower laterals headed back (right). The staked tree has been untied from the stake.

itself.

Train trees for strength, stability and form. Take advantage of the growth habit of a tree in order to train it with the greatest ease. Trees that form laterals on current season's growth, such as Liquidambar and tulip trees, will naturally develop into a central leader (excurrent) tree; little pruning is required in their training compared to trees that form few or no laterals on current season's growth, such as elm and mulberry, which are usually round headed, a decurrent form. Vigorous laterals on decurrent trees must be removed or pruned back unless they are to be selected for a scaffold branch.

To help develop taper and to more uniformly distribute stress along the trunk, at least one-half of the leaves should be on branches that originate on the lower two-thirds of the trunk (5). This holds for trees of any size.

Scaffold branches should be selected to have vertical and radial spacing along the trunk. In addition, branch attachments will be strongest if branches are smaller in diameter than the trunk where they arise.

Following these suggestions will go a long way in assuring a strong, healthy tree.

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